Wolffia and *Lemna* by the coherence for a time of the proliferous parent to its offspring. The yielding to currents of water is a matter of indifference, unless it be to carry the plant into new food regions, which is certainly not well accomplished in some ponds. The disconnection with the soil keeps the stomata above water in the ever changing level of ponds. This is a matter of prime importance to leaves of the second class. A root that would bind our *Wolffia* to the soil would take many times the material of the plant itself. The same thing is effected in others of this class by long petioles and stems which being pliable allow the leaves to float on the water, for if attached stiffly to the stem the running stream would tilt the leaf towards its downward course, and by being longer than absolutely necessary, it allows the leaf to surmount the rise of a stream as well as to follow it in its fall. The same remarks apply to the pliability of stems which having immersed leaves must still effect the elevation of their supplementary floating (*Potamogeton*) or aerial (*Nasturtium lacustre*) leaves, which would otherwise not perform their functions. Floating leaves are generally entire and simple in form to aid their floating; this is supplemented in *Nymphæa regia* by the raised border of the leaf.

Immersed leaves are long and linear (*Potamogeton*, *Vallisneria*) or divided into coarse or capillary segments. These leaves must remain in the water, since out of it they cannot live and also have no stomata to breathe with. So we find arrangements to keep them in the water as long as there is any; the leaves are flaccid or the stem may be weak, and so they rise and fall with the height of the water (some immersed *Potamogetons* and *Vallisneria*.) The two cases are often correlated in capillary leaves, *Utricularia* and *Ranunculus aquatilis*, var. *trichophyllus*), while in other specimens these leaves may be stiff, depending on the flexible stem entirely (*Nasturtium lacustre* and *Ranunculus aquatilis*, var. *stagnatilis*). Since these plants breathe in the water and the amount of surface exposed is an item for them, we find capillary division abounding among immersed leaves. But while aerial leaves have strong fibers to spread out the leaf to the best possible advantage this is effected in water plants by large air holes in the leaf; this may explain their flaccidness also.

Plants having stomata supplemented by large air tubes may lead a double existence, living first in water, and later on the dried-up bottoms of pond or stream as in *Isoetes* and perhaps *Vallisneria septangulare*, *Elatine*, &c. Is not this principle of the uses of leaves a more complete key to these facts than that of changing currents?

(See in this connection "Designs of some leaf-forms" in the March No. of the *Torrey Bulletin*.)—Aug. F. Foerste, *Dayton, O.*

Recently Introduced Plants in and about Rockford, Ill.—The rapidity with which our thriving western cities run through

the earlier stages of their growth, the quick transition from the informality of the fontier village to the stiff and pretentious urban airs of the prosperous manufacturing and trading town, is not more remarkable than the complete change which takes place in the vegetation covering the vacant lots, rubbish heaps and waste places of these communities. I remember well, for instance, how here in Rockford, Ill., say twenty years ago, the indigenous plants of the prairie and oak-opening sprang up on every side in close proximity to the beaten paths of busy men. The industrious young botanist, collecting for exchange, found his only limitations in the quantity of driers he possessed, and the amount of time, energy and discretion he could bring to the work of using them well. Now we must go miles out into the country for material and count ourselves fortunate, even then, if the little vestige of the native flora which last season afforded us a dozen desirable specimens has not since been swept away by the plow; while in the central portion of the city scarcely a single native species remains to dispute possession with street weeds, mostly of European descent and training.

Lactuca scariola, L., which has spread rapidly over the country along the line of railroads, was limited, with us, for a few years, to a single patch on the embankment east of the station-house, but has now been carried all over the city and out into the country even, by mud containing seeds adhering to carriage wheels. It threatens to become a troublesome weed, especially in gravel walks.

Amarantus blitoides, Watson, also brought in by the railroad (but from the west instead of the east), is just gaining a foothold. It takes kindly to sandy, sunny slopes, and spreads over the ground in dense, lusty patches very like Purslane.

The particular occasion for this note, however, is to record—for the first time I believe—the introduction of *Chenopodium Berlandieri*, Moq., in the states east of the Mississippi and north of the Ohio. This is found, not in patches here and there, but scattered everywhere over vacant lots, under walls and along residence streets, keeping company with *Chenopodium glaucum*, *Artemisia biennis* and the omnipresent *Atriplex*; but unlike the nearly allied *C. album*, showing no tendency to intrude as a weed in cultivated grounds. A rather delicate species—for a pigweed—rarely exceeding 18 inches in height, diffusely branched and usually (when not crowded) declining. From its general diffusion the inference is plain that the importation took place years ago, and it seems very strange that a plant showing such complete adaptation to the environment (it is as much at home in town as *C. urbicum* itself) should not have been reported elsewhere. I am at a loss, indeed, to frame any conjecture as to how it got here—for instance, by seeds in mud sticking to the feet of Texas cattle—which does not involve the puzzling question, then why not all along between St. Louis and Chicago as well? I may as well mention, in conclusion, the fact that in some most unaccountable way, *Kochia scoparia*, Schrad., has been turned loose in

our streets and from its chenopodiaceous character, abundant seeding andthe tenacity with which it holds its own in a fair stand-up fight with the street weeds,bids fair to become thoroughly established. One back street near the gas works, where it grew most abundantly, was regraded last winter, and if the coming summer shows that instead of being destroyed it has only been scattered, I think we may fairly count it in as having come to stay. The plant is as symmetrical in habit, when not crowded, as a young Juniper; the foliage at a distance appears soft and graceful (more so than would be imagined by those who have seen only herbarium specimens), and, above all, presents a light yellowish green color which contrasts prettily with the darker bluish green of its associates.—M. S. Bebb, Rockford, Ill.

Dichogamy of Umbelliferæ.—I am under obligations to Mr. Trelease for his kind correction of my mistake in calling *Umbelliferæ* proterogynous. It was caused by Gray's Manual, page 187: "the styles are protruded from the bud some time before the anthers develop," also by personal observations of *Erigenia bulbosa*, Nutt., the only plant of this order which had been investigated by myself previously to *Pastinaca*. This I consider an unmistakable case of proterogyny. The styles protrude from the just unfolding petals for the length of 1 mm. and have an angular divergence of 1-2 mm. At a later stage the stamens expand, the anthers successively dehisce, and during this period the styles approach each other so as to avoid self-fertilization apparently. Frequently this is not effected, and the styles remain expanded. But where they do close during this period they expand again as the stamens grow effete, gradually recurve, become effete themselves, turn reddish-brown and wither away. The stamens and petals drop off at the last expansion of the styles. The different flowers vary greatly, but this is the type development. Not to fall into any error I examined nearly 500 specimens. Therefore I consider our *Erigenia* to be a proterogynous plant, generally fertilized before the development of anthers, but capable of being fertilized by its own pollen, although this is apparently avoided in the first part of the second or polleniferous stage. The coming together of the styles is often indistinct and ineffectual. Plants left unfertilized can then be fertilized in the third stage by their own pollen or even by that of other plants still, since that would be more effective. But I believe that it does not take long for the styles to become effete and the carpels are apparently fructified before this stage in most cases. Although I have caught during the last 4 days 5 species of Diptera near these plants, I have never seen any at work, although I have looked at hundreds of plants in their native state during the last few days, but the days were stormy and cold. Still, from the presence of nectar in large quantities, I am willing to admit that there may be insects that frequent them. Finally, I am of the opinion (thanks to Mr. Trelease) that this plant (deviating from the family type)